

ALGEBRA  
COLLOQUIUM

*Perfect Cuboids and Magic Squares of Squares*

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**Abstract:** A perfect cuboid is a box such that the distance between any two corners is a positive integer. A magic square is a grid filled with distinct positive integers, whose rows, columns, and diagonals add up to the same number. To date, we don't know if there exists a perfect cuboid, or a  $3 \times 3$  magic square whose entries are distinct squares. What do these problems have in common? Secretly, they are both problems about rational points on algebraic surfaces of general type with mild singularities. I believe there is no such thing as a perfect cuboid or a  $3 \times 3$  magic square of squares, and I will try to convince you that geometry suggests this is so.

Monday, December 4, 2023, 3:00 pm  
Atwood 240

MATHEMATICS  
EMORY UNIVERSITY